Message

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Sent: 10/24/2018 5:17:25 PM
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Subject: NERL Weekly Report: Oct 29 - Nov 2, 2018

NERL Weekly Report: October 29 thru November 2, 2018

HOT ISSUES - *Update on any hot issues or ongoing high-profile matters*

- **NESCAUM appreciation letter**

On October 18, Paul Miller, Deputy Director and Chief Scientist of Northeast States for Coordinated Air Use Management (NESCAUM) sent a letter to NERL's Tim Watkins (Director). The letter expressed Miller's appreciation for the efforts of NERL's **Luke Valin** (Post-Doc) for the states of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont during the 2018 summer field campaign to better understand ozone pollution formation and transport in the New York City-Long Island Sound Region as a part of the Long Island Sound Tropospheric Ozone Study (LISTOS). Miller reached out to specifically recognize Valin for coordinating the multiple daily activities involved in the field campaign, his knowledge of tools and participant capabilities, and his "understanding of the states' science needs in support of their air quality planning efforts".

- **Special issue on nutrients and carbon interactions with aquatic systems**

Water Resources Research recently published a special issue on Emergent Aquatic Carbon-Nutrient Dynamics. The journal published this special issue to build upon presentations and discussions from a 2015 research workshop held at China University of Geosciences in Wuhan, China. At this workshop, an international, multi-disciplinary group of scientists discussed ecosystem hydrobiogeochemistry, including stream-groundwater interactions and dynamics at land-atmosphere, land-ocean, and human-natural interfaces. NERL's **Heather Golden** (Systems Exposure Division) is a co-author of the introduction to, and a co-developer of, the special issue. The introductory article, Aquatic Carbon-Nutrient Dynamics as Emergent Properties of Hydrological, Biogeochemical, and Ecological Interactions: Scientific Advances, gives an overview of the complexities of the interactions between nutrients, carbon, and aquatic systems. It also summarizes the articles in the issue, which focus on multi-scale, multi-disciplinary approaches to addressing these interactions; effective management of these problems; the fine-scale processes that are at work; or the large-scale patterns that emerge.

UPCOMING PUBLIC EVENTS – *Two-week outlook*

- **NALMS Tour**

  The 38th International Symposium of the North American Lake Management Society will be held in Cincinnati, Ohio on October 30 thru November 2. The theme for this year's meeting is *Now Trending: Innovations in Lake Management*. Among the field trips offered the symposium's attendees is tour on October 30 of EPA's Aquatic Research Facility and EPA's Experimental Stream Facility. These facilities support SSWR, SHC and CSS projects as well as some collaborative efforts with Regions and OW.

- **Exposome Symposium**

On November 2 and 3, NERL's Jon Sobus (Exposure Methods and Measurements Division) will attend the 2018 Exposome Symposium being hosted in New York City by the Institute for Exposomic Research. The symposium is designed to be an introduction to exposomics, the study of how the complex mix of nutritional, chemical, and social environments shape human health throughout the lifespan. As part of the symposium, Sobus will chair a workshop on non-targeted analysis (NTA) data processing workflows.

- **Overview of Upcoming Events**

  - **Carolinas Climate Resilience Conference**: Columbia, SC, 10/29/2018 - 10/31/2018
    - Presentation: Digging Deeper: Integrating Multi-Disciplinary Expert Knowledge into Resilient System Decision-Making
  - **38th International Symposium of the North American Lake Management Society**: Cincinnati, OH, 10/30/2018 - 11/02/2018
    - Presentation: Ecological Role of Microcystin: Evidence from a Field Study
    - Presentation: Forecasting Microcystis aeruginosa population dynamics from bacterioplankton DNA

- Presentation: Structure and physiological activity of cyanobacterial communities in a freshwater lake: a three-year study using 16S rRNA gene sequencing analysis Presentation

- **ASBPA 2018 National Coastal Conference:** Galveston, TX, 10/30/2018 - 11/02/2018
  - Presentation: Informing Decision-Making for Seaports to Promote Integrative Coastal Resilience
- **International Symposium on Alternatives Assessment:** Sacramento, CA, 11/01/2018 - 11/02/2018
  - Presentation: Bridging Life Cycle and Exposure Ontologies to Enable Integration of Data Streams for Rapid Exposure Estimation and Comparative Exposure Assessment
- **2018 SETAC North America Annual Meeting:** Sacramento, CA, 11/04/2018 - 11/08/2018
  - Abstract: Adverse effects of oral gestational exposure to hexafluoropropylene oxide dimer acid (GenX) in the Sprague-Dawley rat
  - Presentation: An integrated RICEWQ-AnnAGNPS modeling system to evaluate the fate and transport of thiobencarb in Colusa Basin, Northern California
  - Abstract: Assessing Environmental Surface Water Exposure by Cell Culture-based Metabolomics
  - Presentation: Assessing the suitability of the Bad River as a reference system for the St Louis River AOC using geochemistry, biotic condition of macroinvertebrates and bioaccumulation of mercury
  - Poster: Characterizing Urban Background Levels to Support Contaminated Site Cleanup
  - Presentation: Developing non-targeted analysis techniques for chemical prioritization in environmental water samples
  - Abstract: Developmental estradiol exposure results in microbiota-dependent effects on locomotor activity in larval zebrafish
  - Presentation: Differential Expression of microRNAs in Fathead Minnow Larvae Exposed to Ethinyl Estradiol
  - Presentation: Effects of Metformin on Growth and Appetite in Juvenile Fathead Minnows (Pimephales promelas)
  - Poster: Effects-based monitoring of bioactive contaminants associated with exposure to wastewater treatment plant discharge on the Colorado River
  - Abstract: Efficiency of Pharmaceutical and Personal Care Product Removal from Wastewater Effluent by a Constructed Wetland
  - Presentation: Enhancing the utility of the ECOTOX knowledgebase via ontology-based semantics mapping
  - Abstract: Environmental Metabolomics for in situ Monitoring of Eastern Oysters Affected by Stressors from Point and Nonpoint Sources Along Coastal Georgia, USA
  - Abstract: Evaluating effects of bioactive contaminants related to waste water treatment plant effluent on the South Platte River

- Presentation: Examining the interrelationships between chemical and non-chemical stressors and inherent characteristics to explain the disparities in children's mental health
- Abstract: Genome-wide Assessment of CpG-methylation Changes in Male Fathead Minnows after Exposure to 17-ethynylestradiol (EE2)
- Presentation: High-Resolution Mass Spectrometry-based Metabolomics for Translating Exposure Effects Across Species
- Presentation: Identifying chemicals in the indoor environment that can serve as tracers for estimating children's non-dietary ingestion from dust exposure
- Abstract: Investigating the effects of DNA methylation on EE2 induction of Estrogen Receptor alpha gene expression in fathead minnows (Pimephales promelas)
- Presentation: Low concentrations of carbonaceous nanomaterials in soil affect soybean growth and dinitrogen fixation
- Abstract: Metabolic Changes Associated with Gonadal Abnormalities in Male Japanese Medaka and Largemouth Bass: A Cross-Species Comparison, From the Lab to the Field
- Presentation: Metabolite Assessing Chemical Exposures and Ecological Impacts of Environmental Surface Waters Using Cell Culture-based Metabolomics
- Abstract: Modeling the post-ingestion bioaccessibility of organic compounds sorbed to soils and house dusts
- Abstract: PCB export at the lower Ottawa River (Maumee River AOC): A pre- and post-dredging analysis of sediment, passive samplers, aquatic invertebrates, and riparian spiders
- Presentation: Prioritizing Contaminants in Complex Mixtures Using In vitro-based metabolomics and Multivariate Statistics
- Poster: Saving Two Birds with One Stone: A Unified Approach for Protecting Listed Species and Ecosystem Services in Geographically Isolated Wetlands Using Community-Level Protection Goals
- Abstract: Study Design and Initial Results for EPA's Non-Targeted Analysis Collaborative Trial (ENTACT)
- Poster: TechTracker Tool Documents Cooperative Federalism at the EPA
- Presentation: Use of passive samplers for the detection of extra cellular algal toxins in stream mesocosms, lakes and streams

- **NanoSafe 2018- 6th International Conference on Health and Safety of Nanomaterials:** Minatec Grenoble France, 11/05/2018 - 11/09/2018
  - Abstract: Artificial aging of commercial plastics to evaluate environmental nanofiller release
- **NADP Scientific Symposium and Fall Meeting**: Albany, NY, 11/05/2018 - 11/09/2018
  - Presentation: Evaluation and Intercomparison of Modeled Atmospheric Deposition over North America and Europe - An Overview of Phase 4 of the Air Quality Model Evaluation International Initiative

- **International Air Quality Forecasting Research Workshop**: Boulder, CO, 11/07/2018 - 11/09/2018
    - Abstract: Beyond the Horizon: Opportunities to leverage forecasting data in citizen science public health initiatives
- **American Public Health Association:** San Diego, CA, 11/10/2018 - 11/14/2018
    - Abstract: Characterizing Exposures to Tire Crumb Rubber Used on Synthetic Turf Playing Fields
    - Abstract: Modeling the Post-Ingestion Bioaccessibility of Organic Compounds Sorbed to Soils and House Dusts
    - Presentation: Overview of US Federal research on use of tire crumbs (part of session entitled "Characterizing Exposures to Tire Crumb Rubber Used on Synthetic Turf Playing Fields")
    - Abstract: The Occurrence of Legionella Pneumophila and Mycobacterium Avium at Residential and Office Buildings - a Public Health Perspective
- **2018 ESA, ESC, and ESBC Joint Annual Meeting:** Vancouver Canada, 11/11/2018 - 11/14/2018
    - Abstract: Predicting Mosquito-Borne Disease Across a Gradient of Urbanization with Spatiotemporal Bayesian Models

- **EPA-RTP STEM Outreach Program**

On October 29 and October 31, EPA-RTP's Community Engagement and STEM Education Program will participate in Citizen Schools at Githens Middle Schools in Durham, N.C. Citizen Schools partners public middle schools in low-income communities with local professionals to provide enrichment by engaging students in active learning during the school day for four or five sessions a semester.

On October 30, EPA-RTP's Community Engagement and STEM Education Program will:

- speak at the career fair at Hodge Road Elementary School in Knightdale, N.C. and
- present on Environmental Management Systems at North Carolina A&T State University in Greensboro, N.C.

On October 31, EPA-RTP's Community Engagement and STEM Education Program will:

- lead its fifth EPA Environmental Club for 3rd-5th graders at E.K. Powe Elementary School in Durham, N.C. and
- participate in a coaching session for the Leader Triangle's Transforming Leaders fall semester.

On November 1, EPA-RTP's Community Engagement and STEM Education Program will participate as career role models in an afterschool program for African American males at Powell Elementary School in Raleigh, N.C.

On November 2, EPA-RTP's Community Engagement and STEM Education Program will host approximately 40 high school students who are studying Earth and Environmental studies at Triad

Math and Science Academy in Greensboro, N.C. The students will spend time on the EPA-RTP campus for tours, hands-on activities, and speed mentoring.

UPCOMING MAJOR DECISIONS – *Two-week outlook*

Nothing to report.

LAST WEEK HIGHLIGHTS

- **Distinguished Alumni Award**

On October 23, National Science Foundation's Baltimore Ecosystem Study announced that it is awarding NERL's **Tammy Newcomer-Johnson** (Systems Exposure Division) with a Distinguished Alumni Award. This award is being given in recognition of Newcomer-Johnson's contributions to Baltimore Ecosystem Study Long Term Ecological Research Site when she was a graduate student.

ALL THE REST

- **West Nile Virus modeling publication**

Science of the Total Environment recently made available online Spatiotemporal Bayesian modeling of West Nile virus: Identifying risk of infection in mosquitoes with local-scale predictors by NERL's **Mark Myer** (ORISE) and **John Johnston** (Computational Exposure Division). The article describes a study on the development of a model to predict mosquito presence and viral incidence. The researchers developed models based on West Nile surveillance data collected from mosquito trap sites over 15 years. The best model predicted West Nile positives well (72%). The study demonstrates that models can be useful for decision making so that disease and vector control organizations can prioritize and their prevention efforts.

- **Chemical cocktails publication**

On October 22, Biogeochemistry published Watershed 'chemical cocktails': forming novel elemental combinations in Anthropocene fresh waters. Among the authors on this article is NERL's Tammy Newcomer-Johnson (Systems Exposure Division). During the current geological age, the Anthropocene, watershed chemical transport is increasingly dominated by novel combinations of elements linked together as 'chemical cocktails.' This prompts the development of a new approach to studying chemical transport in water, one that focuses on the chemical cocktails. This approach would allow scientists to trace contaminant mixtures in watersheds, develop chemical proxies with high-resolution sensor data, and manage multiple water quality problems. The authors explore the development of this approach by asking whether elemental transport in watersheds can be classified as chemical cocktails using a new approach

and what is the role of climate and land use in enhancing the formation and transport of chemical cocktails in watersheds. The study finds that a watershed chemical cocktail approach is necessary to effectively co-manage groups of contaminants and provide a more holistic approach for studying, monitoring, and managing water quality in the Anthropocene.